working data, which for each furnace is ascertainable in particular. If one knows, for example, that the roof and the before-named portions of the port block last out GOO charges of 80 tons, that is to say in the run of the furnace 18,000 tons of charge are able to be worked, whilst In the manufacture of this portion about 52,000 kilogrammes of gannister are necessary, of which after shutting off the furnace there still is present one-half, one finds that during the run of the furnace 2(>,000 kilogrammes of SiOa must have reached the bath, or per 100 kilogrammes of charge, 0*15 kilogrammes of SiOa, or in general 0*15 per cent, of BiOa on the weight of metallic charge . . . (80o).

(4.) Usually, the before-mentioned amounts of silica are sufficient to more than cover the requirement of tins material by the slag ; but there will be added to the bath still further silica from the bottom and the walls of the furnace, with which the metal and the slag come into direct contact. Especially the latter gives rise in the so-called slag zone to a not small wear of the banks, which must be renovated after each charge by means of fresh materials. Since, however, there is generally not enough time to admit of adequately burning i'ast tho renovating material, this will also be nearly completely dissolved by each new charge.

The hearth of the basic furnace is generally made out of burnt dolomite, and if this material possesses the composition SiOa G per cent. + CaO 55 per cent.+MgO 84 per cont.+ Balance (Al^Oa and Fea08) Mid the dolomite requirement amounts to about 5 per cent., then of this material about Gx "05=0*3 per cent, of SiOa on the weight of the metallic charge, taken at 80 tons, comes into the bath . . . (80i>). In basic furnaces of this capacity, and in which the dolomite requirements amount to the above, the entire addition of SiOa of the furnace structure will be ()"15 + 0"80=0*45 per cent, of the weight of metallic charge (taken at 80 tons) . . . (80 K).

In the basic open-hearth furnace, a portion of the amounts of lime for the formation of slag come partly from the same source an the amounts of silica last considered. In addition to lime, the magnesia also in the dolomite is enabled to satisfy the acids which make their appearance, and if a burnt